

NIEHS News

Training Doctors in Environmental and Occupational Medicine

In the late 1980s, several reports, including one from the Institute of Medicine, identified the teaching of environmental and occupational medicine at most medical and osteopathy schools as virtually nonexistent. The Institute of Medicine report further maintained that the field was held in low regard by most medical practitioners and students, resulting in few primary care physicians being knowledgeable about environmental health issues. The report stated that primary care physicians should be able to identify illnesses related to environmental agents. A report from the American College of Physicians went further, recommending that physicians should also recognize patients who need counseling about environmental risk and be able to refer them to appropriate sources if the physicians cannot provide that counseling.

To address this need, NIEHS announced its first competition for environmental and occupational medicine academic awards in February 1990. The awards had the dual purpose of improving the quality of environmental and occupational medicine curricula and fostering graduate research careers in environmental and occupational medicine among medical students and residents. Today, the long-term goals of the program continue to be twofold: to develop and sustain the best possible curricula at the awardees' institutions and to develop these plans in such a way that they can be made available to other institutions with fewer resources and faculty. In addition, to institutionalize the goals of the award beyond the duration of the grant, the awardees are expected to provide leadership in faculty development in environmental and occupational medicine.

Thirteen Environmental/Occupational Medicine (E/OM) Academic Award grants have been awarded to medical schools. "The response to the first program

announcement was overwhelming," said Annette Kirshner, head of the NIEHS Scientific Programs Branch within the Division of Extramural Research and Training. "By the first application deadline on 1 June 1990, the institute received 34 applications for review, two to three times the anticipated response." In that first round, eight awards were made totaling \$1 million, using \$500,000 of extra funds transferred into the budget for that purpose. The following year, 12 applications were received and 3 awards funded, and in the third competitive round, 14 applications resulted in 2 awards.

The E/OM Academic Award program is an integral part of NIEHS's emphasis on clinical research and prevention and intervention strategies. Moving research results from "laboratory to bedside" has been a recurring theme. Recently, NIEHS joined with the University of North Carolina School of Medicine and Duke University Medical Center in an agreement that allows NIEHS staff to collaborate with university researchers at university clinical research units funded by the National Institutes of Health, in effect giving NIEHS a clinical center and giving the universities greater access to NIEHS laboratories and staff scientists. NIEHS is also funding a clinical trial at a number of centers around the country to study succimer, a therapeutic drug for lead toxicity.

"Ultimately, the public must rely on physicians, and especially those in primary care, to carry the benefits of environmental health science research to patients," said Kenneth Olden, NIEHS director. "For a very modest investment, we are reaching out to class after class of students in medical schools, through their faculty, and preparing them to make a rapid transfer of research advances to detect, treat, and prevent environmentally related diseases and dysfunctions." The relatively low cost of the widespread benefits is cost effective in a time of tight budgets. As a condition of the

E/OM Academic Award grants, awardees meet once a year to exchange ideas, methods, and program evaluations.

NIEHS encourages faculty grantees at the universities to adapt their projects to the particular institutional characteristics and needs of each university, and the grantees have responded with a diversity of approaches. A grantee at the Mount Sinai School of Medicine in New York City, for example, is providing instruction to students and residents within existing courses and clinical seminars. Three elective courses are also offered in coordination with the Mount Sinai summer elective program for medical students, as well as a mini-course series of lectures offered within a primary care resident lecture series. The Mount Sinai program has emphasized the development of lecture and seminar material to strengthen their efforts because they have found that faculty are more likely to incorporate teaching environmental and occupational medicine in existing courses and clinical settings if high-quality curriculum material is available.

Another key effort has been coordinated by Mark R. Cullen at Yale and his colleague Linda Rosenstock at the University of Washington, where a new comprehensive test is nearing completion that will, according to Cullen, "greatly enhance access to specialty knowledge of the field." Cullen points out that the research program in environmental medicine has broadened to integrate new aspects of molecular biology into existing clinical and epidemiological components.

At some institutions, teaching techniques have been adapted to the needs of the program. James P. Keogh, of the University of Maryland, reports that the sophomore occupational/environmental medicine course piloted the exclusive use of a technique called small-group, problem-based learning, which pairs a small group of students with faculty mentors.

Said Keogh, "We found that students

ENVIRONMENTAL/OCCUPATIONAL MEDICINE ACADEMIC AWARD GRANTEES

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can learn technical content and problem-solving skills by participating in an active learning experience. . . . This approach helps with the curricular goal of creating lifelong learners."

One of the major tools in environmental and occupational medicine, especially for primary care physicians, is the environmental and occupational history of the patient. Knowing how to compile this history is a fundamental skill for discovering which patients may be at risk for environmental and occupational diseases. Howard M. Kipen of the University of Medicine and Dentistry of New Jersey and his colleagues have developed a mnemonic to enhance recall of the critical components in taking patient histories. "We hope that eventually students will be as comfortable with this long-neglected portion of the medical encounter as they are with more traditional content," Kipen said.

The National Jewish Center for Immunology and Respiratory Medicine in Denver, Colorado, another grantee institution, has organized an official environmental/occupational medicine rotation for internal medicine students as well as a residency program. Kathleen Kreiss of the Department of Medicine said, "The presence of the residency program and the increased curricular offerings have a ripple effect that increases awareness of environmental and occupational health issues and interest in other residents and medical students in clinical rotation."

The grant recipients are also generally involved in research that builds the knowledge base within environmental health sciences and enriches the educational experience of students in the programs at grantee institutions. For example, Steven McCurdy of the University of California at Davis is conducting occupational health studies among two groups. A study of workers in the semiconductor industry found an increasing dose-response relationship between hours spent in semiconductor fabrication rooms and upper respiratory tract symptoms, as well as musculoskeletal complaints of the hand and forearm, which he says are "likely due to repet-



Field work. Grantee Kathleen Kreiss (left) and Carol Epling of the National Jewish Center for Immunology and Respiratory Medicine discuss field work at a Denver construction site.

itive motion exposures." Published studies of farm workers described respiratory disease and dermatitis, especially decreased vital lung capacity in grape workers. McCurdy conducted a pilot study of respiratory and general health among Hispanic workers in a rural Southern California community, and the results of this study are currently being analyzed.

Anne P. Sassaman, director of the NIEHS Division of Extramural Research and Training said, "Hearing firsthand from faculty conducting research enhances students' ability to interpret research results and make use of such results once students begin their practices." Sassaman added that NIEHS is also participating in a study conducted by the Institute of Medicine to explore training opportunities in nursing education and research.

For information about the NIEHS Environmental/Occupational Medicine Academic Awards, contact Annette Kirshner at NIEHS, MD 3-02, PO Box 12233, Research Triangle Park, NC

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Trihalomethanes and Colorectal Cancer

Studies conducted at NIEHS have shown that administration of certain trihalomethanes, by-products of water chlorination, and several brominated chemicals cause colorectal cancer in experimental animals. Epidemiologic studies now suggest a link between the consumption of chlorinated water and increased human risk for colorectal cancer.

Colorectal cancer is a major cause of morbidity and mortality in the United States, with an estimated 150,000 new cases and 60,000 deaths per year. In recent years there has been a tremendous burst of knowledge of the molecular events involved in the development of human colorectal cancer. Consequently, the molecular genetics of colorectal cancers are among the best understood of any human cancer. Because genetically inherited cases

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